On nested Archimedean copulas

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When dealing with nested Archimedean copulas, all the functions involved are until now assumed to be either completely monotone or completely alternating. Otherwise it seemed to be impossible to prove the crucial monotonicity conditions required for copulas. We will show that *complete* monotonicity can be replaced by appropriate *finite* versions, depending in a natural way on the dimensions involved, thus enlarging the class of "nestable" Archimedean copulas considerably. Our proof is based on rather recent results on multivariate higher order monotonic functions.